Towards understanding the associations between health literacy and physical health

Towards understanding health literacy and health

[don't hold your breath, though...]

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ISIR, 10 December 2011, Limassol, Cypros

What is healh literacy?

A big time thing in medicine

- Health literacy is ...

> *"... a set of skills that people need to function effectively in the health care environment ... print literacy ... numeracy ... oral literacy..."* *(Berkman et al., 2011)*

- Far more than a thousand published reports
- Why they bother? Because it matters
  - Low literacy predicts ill health and poor health management
  - Not everyone benefits from same options equally

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Let's overcome the literacy barrier

People more literate, healthcare less literate

- Raising health literacy shoud result in better health
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Popular measures of health literacy

- Rapid Estimate of Adult Literacy in Medicine **(REALM)**
  - NART with 66 (almost) medical words
- Shortened Test of Functional Health Literacy in Adults **(TOFHLA)**
  - 4 numeracy items (mimic well real-life health tasks)
  - 36 reading comprehension tasks (sentence completetion)
  - "Do not [drive/drink/dress/dose], even [heart/breath/water/cancer]."
- Newest Vital Sign **(NVS)**
  - 6 questions based on a US nutrition label
  - Spot numbers and do some math

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You've already heard about this, right?

Well, chances are that they are'nt

- Sounds like health literacy could be another flavour of intelligence (*g*) (Murray et al., 2011, Intelligence)
- Low *g* also tends to predict worse health
- 1 + 1 = poor health literacy may predict poor health because it reflects poor *g*

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Should we bother?

Health literacy or IQ, who cares

- Health literacy measures are good-enough screening tools
  - Quick, no IQ flavour
- But if they predict health only because they reflect *g*, health literacy won't ***explain*** health differences
  - Raising literacy alone won't help (and you can't raise *g*)
  - Poor literacy may be just one of the barriers, so making leaflets simpler won't suffice either

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This study

One of the first of the kind

- Does health literacy predict eight general health outcomes in older people?
- To which extent it is so because health literacy reflects *g*?
- To which extent it is so because of shared life-course influences?

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Sample

- Lothian Birth Cohort 1936 (LBC1936)
- 866 people (52% men; health literacy measured in just under 800)
- Mean age 72.49 ± 0.73 years

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Health outcomes

	N	M	SD
Six meter walk time	860	4.35	1.32
Forced expiratory volume in 1 second (FEV1)	856	2.3	0.68
Grip strength	865	29.55	9.43
Ankle brachial pressure index (ABPI)	756	1.08	0.18
Interleukin-6 (IL-6)	815	2.05	1.73
Number of natural teeth	793	16.68	8.87
Body mass index (BMI)	866	27.92	4.45
Haemoglobin A1c (HbA1c)	826	5.75	0.66

Covariates

Do these account for health literacy-health links?

- *g* (PC of six WAIS non-verbal subscales)
- Various earlier or life-course factors
  - Childhood IQ
  - Educational level (5 ordered levels)
  - Occupational social class (6 ordered levels)

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Health literacy fared well

	Walk time	FEV1	Grip	ABPI	IL-6	#teeth	BMI	HbA1c
REALM *	**-.12**	**.11**	**.07**	**-.10**	**-.10**	**.18**	**-.11**	-.01
TOFHLA	**-.12**	.04	**.05**	**-.10**	**-.12**	.07	-.04	-.05
NVS	**-.19**	**.10c**	**.09**	.00	**-.11**	**.18**	**-.11**	-.04

NOTE: β coefficients controlling for age and sex

- 17 of the 24 associations 'significant', with a **median effect size 0.11**

But the others fared well too

Actually even better

	Walk time	FEV1	Grip	ABPI	IL-6	#teeth	BMI	HbA1c
Age 11 IQ	**-.19**	**.09**	**.07**	**-.02**	**-.11**	**.17**	**-.14**	**-.09**
g	**-.30**	**.16**	**.15**	**.02**	**-.15**	**.19**	**-.08**	**-.07**
Educational	**-.25**	**.15**	**.07**	**.01**	**-.12**	**.28**	**-.19**	**-.09**
Social class	**-.16**	**.12**	**.06**	.00	**-.14**	**.21**	**-.12**	.00

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Did health literacy outperform *g*?

Nope

- 8 of the 17 initially 'significant' health literacy-health associations remained 'significant' after taking *g* on board
- Median effect size across the 17 dropped from 0.11 to 0.06
- Median effect size for *g* was 0.13

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Did health literacy beat earlier influences on health?

Nope, lost again

- Childhood IQ, educational level and occupational social class in the model along with health literacy
- 6 of the 17 initially 'significant' health literacy-health associations remained 'significant'
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More education and higher *g* make healthy

Health literacy is just a little guy here

- Childhood IQ, educational level, occupational social class **and *g*** in the model along with health literacy
- 3 of the 17 initially 'significant' health literacy-health associations remained 'significant' (median effect size 0.04)
  - For *g*, 12 of the 17 associations were 'significant' (median effect size 0.10)
  - For education, 9 of the 17 associations were 'significant' (median effect size 0.09)

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Conclusions

You probably knew it, but many don't (want to)

- Health literacy measures may be useful as screening tools
  - Easy to administer
  - Fit well to medical settings (no IQ-test flavour)
- But they are not very helpful for explaining health differences
- Health management probably takes more than reading slips and labels or doing some 'health math'
  - Teaching people to read and do math may not be sufficient to make them healthy

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All human participants are tested at the Wellcome Trust Clinical Research Facility; MR imaging is conducted at the SFC Brain Imaging Research Centre

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